ABSTRACT

Aim: Graduation theses was aimed on the use of the isolated rat renal cells to study of transport mechanisms of the selected receptor – specific peptides from the group of somatostatin analogues labeled with convenient radionuclides - ^{111}In-DOTA-octreotate, ^{125}IDOTA-
octreotate. Experiment with the selected model substances - sucrose and α-methyl glucoside as markers of active and passive transport was executed. Accumulation process of α-methyl glucoside was tested in renal and pancreatic cells. Further, accumulation of the radiopeptides was researched in presence of the potential inhibitors, which could reduce to retention these radiopeptides and thus also clinically undesirable renal radiotoxic insult.
Methods: Isolated rat renal cells were prepared by collagenase technique. Pancreatic rat exocrine cells were prepared from cell line tumor cells. Viability of cells was tested with trypane blue. The accumulation rate of model substances was compared with the accumulation radiopeptides rate: ^{111}In-DOTA-octreotate, ^{125}I-DOTA-octreotate. Transport character was also monitored for low temperatures. Megalin/cubilin membran transport system was researched via their ligands (e.g. albumin, gentamicin), which could inhibit accumulation of the radiopeptides by competition in transport.
Results: Cells viability was enough high. Sucrose accumulation was significantly lower than α-methyl glucoside in the renal cells. In comparison α-methyl glucoside accumulation in pancreatic cells was lower for degree with renal cells. Incubation for low temperatures (1-2°C, 5-6°C), which inhibits active transport mechanisms, caused strong reduction of studied radiopeptides uptake. The accumulation was lowered in the presence of specific inhibitors. The accumulation rate increased with increasing cells number or quantity of radiopeptide.
Reason: Low accumulation of sucrose showed only its passive transport. Low α-methyl glucoside accumulation in pancreatic cells shows that renal cells capacity for transport of glucose is significantly higher. ^{111}In-DOTA-octreotate, ^{125}I-DOTA-octreotate are accumulated partially by active transport in isolated renal cells. This was showed in incubation for low temperatures. The inhibitive action of inhibitors on the uptake could demonstrate participation of megalin/cubilin transport system.